

What is claimed is:



1. A tungsten-containing powder-based shot slug, comprising:
a body including:
a nose portion configured to first leave a barrel of a firearm
from which the slug is fired, and
a base portion configured to trail the nose portion through the
barrel of the firearm from which the slug is fired, wherein the base portion
includes an outer skirt that laterally defines a rear internal recess extending into
the body; and
wherein the body is formed via powder metallurgy from at least a
tungsten-containing component and a binder.
2. The shot slug of claim 1, wherein the body is forward-
weighted, with the nose portion containing a majority amount of the body's mass.
3. The shot slug of claim 1, wherein the nose portion defines a
front internal recess extending into the body.
4. The shot slug of claim 3, wherein the front internal recess
extends at least 5% of the slug's length.

5. The shot slug of claim 1, wherein the nose portion does not include a front internal recess extending into the body.

6. The shot slug of claim 1, wherein the outer skirt is tapered.

7. The shot slug of claim 1, wherein the outer skirt defines an outer perimeter that at least substantially corresponds to the diameter of a firearm barrel from which the shot slug is fired.

8. The shot slug of claim 1, wherein the rear internal recess extends at least 20% of the slug's length.

9. The shot slug of claim 1, wherein the rear internal recess extends at least 40% of the slug's length.

10. The shot slug of claim 1, wherein at least a portion of the body has an outer diameter that is dimensioned so that the barrel of the firearm from which the slug is fired imparts ballistic control to the slug.

11. The shot slug of claim 1, wherein the slug has a density in the range of 10.9 grams/cubic-centimeter and 11.7 grams/cubic-centimeter.

12. The shot slug of claim 1, wherein the slug has a density in the range of 8 grams/cubic-centimeter to 11 grams/cubic-centimeter.

13. The shot slug of claim 1, wherein the slug has a density in the range of 11.5 grams/cubic-centimeter and 17 grams/cubic-centimeter.

14. The shot slug of claim 1, wherein the tungsten-containing component includes an alloy of tungsten, nickel and iron.

15. The shot slug of claim 1, wherein the tungsten-containing component includes tungsten and iron.

16. The shot slug of claim 1, wherein the binder includes tin.

17. The shot slug of claim 16, wherein the binder further includes a polymeric binder.

18. The shot slug of claim 17, wherein the polymeric binder includes a thermoset epoxy.

19. The shot slug of claim 1, wherein the binder includes a polymeric binder.

20. The shot slug of claim 1, wherein the body is frangible.
21. The shot slug of claim 1, wherein the body includes an outer surface and a sealant infiltrated beneath the outer surface.
22. The shot slug of claim 21, wherein the sealant includes a heat-curable sealant.
23. The shot slug of claim 21, wherein the sealant is adapted to be cured by exposing the sealant to an anaerobic environment
24. The shot slug of claim 1, wherein the body includes a shoulder generally between the nose portion and the base portion.
25. The shot slug of claim 24, wherein the shoulder defines a plane extending transverse to a central axis of the slug.
26. The shot slug of claim 1, wherein the body is formed from non-toxic, lead-free materials.
27. A shot-slug cartridge containing the shot slug of claim 1.

28. A method of forming a shot slug, comprising:
mixing at least a tungsten-containing powder and a binder to form a non-toxic lead substitute; and
compacting the non-toxic lead substitute into a shot slug that includes a nose portion and a rearward portion with an outer skirt that laterally defines a rear internal recess extending into the slug at least 10% of the slug's length.

29. The method of claim 28, further comprising sealing the slug.

30. The method of claim 29, wherein the slug has an outer surface and the sealing step includes infiltrating a sealant beneath the outer surface of the slug.

31. The method of claim 30, wherein the sealing step includes infiltrating the sealant beneath the outer surface of the slug by vacuum infiltration.

32. The method of claim 30, wherein the sealing step includes curing the sealant by exposure of the sealant to an anaerobic environment.

33. The method of claim 28, further comprising plating the slug.

34. The method of claim 28, further comprising sintering the slug.

35. The method of claim 28, wherein the tungsten-containing powder includes an alloy of tungsten, nickel and iron.

36. The method of claim 28, wherein the tungsten-containing powder includes tungsten and iron.

37. The method of claim 28, wherein the binder includes tin.

38. The method of claim 28, wherein the binder further includes a polymeric binder.

39. The method of claim 28, wherein the binder includes a flexible thermoset epoxy and tin.

40. The method of claim 28, wherein the non-toxic lead substitute is compacted with a compaction pressure to yield a slug with a density in the range of 10.9 grams/cubic-centimeter and 11.7 grams/cubic-centimeter.

41. The method of claim 28, wherein the non-toxic lead substitute is compacted with a compaction pressure to yield a slug with a density in the range of 8 grams/cubic-centimeter and 11 grams/cubic-centimeter.

42. The method of claim 28, wherein the non-toxic lead substitute is compacted with a compaction pressure to yield a slug with a density in the range of 11.5 grams/cubic-centimeter to 17 grams/cubic-centimeter.

43. The method of claim 28, wherein the slug further includes a front internal recess.